RESILIENT POWER

What States Should Do:
A Guide to Resilient Power Programs and Policy
— Summary for Policy Makers —

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Key Take-Aways from this Report

In addition to specific recommendations for state decision-makers, this report reveals a burgeoning movement at the state level to promote and support resilient power deployment. The resilient power planning, programs, and investment that started in the Northeast are quickly spreading to other regions, and competitive solicitations are beginning to give way to financing and incentives, as states adjust their programs to take advantage of emerging markets for distributed energy and energy storage. These overarching take-aways tell the story of the resilient power movement to date:

• In the two-and-a-half years since Superstorm Sandy, some $400 million in new state-managed funds have been dedicated to resilient power efforts in the Northeast alone, leveraging hundreds of millions more in private funds.

• More than 90 critical facilities in the Northeast – including emergency shelters, wastewater treatment plants, firehouses and other first responder facilities – will have resilient electrical systems in place to improve emergency response in the next year, and to protect neighborhoods in the next power outage.

• States first addressed resilient power through heavily subsidized demonstration projects, but have quickly evolved toward more permanent, cost-effective and market-oriented solutions that provide financing and leverage emerging energy services markets.

• Resilient power has proved that it not only provides clean backup power during grid outages, it can also reduce costs and provide additional income streams to the host facility or owner year-round.

• Natural disasters are not confined to the Northeast, and resilient power is a concept that is quickly taking hold throughout the country.
This report is the first comprehensive survey of state resilient power programs, policies and funding efforts put in place since Superstorm Sandy devastated the Northeast United States in October 2012, disrupting electric service to more than eight million people in 17 states. In a rare example of a positive outcome from a natural disaster, a number of these states have embarked on new and ambitious resilient power programs, aimed at protecting critical facilities and vulnerable populations from the worst impacts of future disasters. In the first two years following the storm, more than $400 million in new state funds have been dedicated to resilient power efforts in the northeast alone, and this money has leveraged many more millions in private funds.

We believe this trend represents a promising new path for clean energy programs across the country. The state efforts showcased in this report demonstrate that, when installed in combination and designed properly, renewables and energy storage offer not only environmental and economic benefits, but can also save lives and protect vulnerable populations.

This report describes the actions of leading states in the new arena of resilient power, here defined as clean, distributed energy and storage resources sited at critical facilities, configured to provide power continuously, and able to island and continue to provide electricity in case of a grid outage. The report summarizes what early adopter states have done to support the deployment of clean resilient power technologies, and their results so far. It presents policy and program tools that these states have used, and it suggests others that could be employed by states. And it makes recommendations based on lessons learned over the first year of resilient power programs in several key states.

Although backup power for grid outages has traditionally been provided by diesel generators, resilient power differs from diesel generators in several important respects.

First, it is cleaner, employing renewables, energy storage, and high-efficiency, low-emissions technologies such as combined heat and power (CHP) and fuel cells. Second, it runs year-round, providing daily benefits to the host facility, whereas diesel generators sit idle 99 percent of the time. Third, because it is designed for daily use, resilient power is more reliable than diesel backup generators, which have a high incidence of failure, in part because they are seldom used. Fourth, resilient power does not rely on deliveries of liquid fuel, which may be difficult or impossible during a disaster. And fifth, in some places, resilient power technologies can produce income for their owner/operators by allowing them to bid into electric services markets such as the frequency regulation and demand response markets, as well as reducing electricity costs through peak shifting and reduction of electricity demand charges for the host facility.

Superstorm Sandy was not the first storm to wreak such havoc on the grid, but it was the first to move the affected states to enact new policies and initiatives to promote resilient power programs employing clean energy technologies. Northeastern governors declared such storms the “new normal” and called for immediate action to prepare their states before the next disaster. Legislatures passed bills and allocated funds. And, led by Connecticut, New Jersey, Massachusetts, and New York, the Resilient Power movement was born.

Throughout the aftermath of Sandy and the emergence of the resilient power movement in the Northeast, Clean Energy Group has offered support to states, municipalities, developers and others engaged in this important work, in the form of direct policy and program support, stakeholder outreach and knowledge sharing, and a technical assistance fund to help support project deployment in low-income neighborhoods. This report is part of our ongoing effort to promote and support clean, resilient power deployment, in the Northeast and across the country.
Key Findings

This report examines resilient power programs in the above-mentioned Northeastern states, as well as related actions in other states, such as Florida and California. Because many of these programs are new or still developing, final conclusions cannot yet be drawn; but the report does make recommendations based on lessons-learned during the first year of monitoring state resilient power activities.

Based on early results and the experiences of state energy officials and staff, this report recommends that future state resilient power efforts incorporate these elements:

- Engage in a thorough pre-program stakeholder process that includes municipalities, utilities and other stakeholders; involve vendors, developers and service providers when developing resilient power programs
- Assess specific resilient power needs and target funding to meet those needs
- Consider the needs of low-income and vulnerable communities
- Create a flexible program that allows communities to design systems to meet local needs
- Market the program to municipalities
- Provide pre-application technical assistance to municipalities and other applicants
- Provide financing assistance and information to applicants, including:
  - Information on municipal financing options, such as municipal bonds
  - Minimally restricted program funds that can be used for a wide variety of purposes, including paying for equipment, engineering and design, construction, etc.
  - A variety of funding and finance tools including loans, grants, and credit enhancement
- Allow resilient power projects to access available value streams, for example by engaging in sales of electricity market services or electricity arbitrage, so long as the system can provide the required resiliency benefit when called upon to do so
- Conduct rigorous evaluations of proposed financing for projects
- Require performance monitoring and evaluation

This report also discusses policy tools and incentives, which may be used by states in supporting resilient power deployment, and gives examples of their use. These tools include:

- Solicitations/RFPs
- Renewable Portfolio Standards and Stand-Alone Mandates
- Adders, multipliers and carve-outs
- Prescriptive rebates
- Integrating resilient power into longer-term state policy

In addition to the traditional policy tools listed above, the report also discusses emerging role of green banks and energy resilience banks, and it addresses the important role of third-party service providers, an emerging industry offering energy storage benefits and relying on new electricity services markets supported by Federal Energy Regulatory Commission (FERC) rulings. These providers and the electricity markets that support them are rapidly becoming vital to resilient power programs in some states, as evidenced by New Jersey’s $3 million Renewable Electric Storage Incentive program, which has made awards to 13 solar+storage projects at critical infrastructure facilities. All 13 projects base their pro formas on sales of frequency regulation services into the PJM Interconnection, a regional transmission organization serving all or parts of Delaware, the District of Columbia, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, and West Virginia.
As similar electric service markets develop in other regions of the country, more states should be able to incentivize private solar+storage firms to co-locate at critical facilities, where they can provide resilient power benefits while selling needed services to the grid on a daily basis. Clean Energy Group believes the development of these markets will be essential to the cost-effective deployment of resilient power technologies going forward.

At this writing, most active state resilient power programs are concentrated in the Northeast. Massachusetts has implemented a $40 million program, New Jersey has implemented a $3 million resilient energy storage program and a $200 million Energy Resilience Bank—the first such institution in the nation—Connecticut has implemented a $48 million microgrid program, New York has a $40 million microgrid program underway, Rhode Island has drafted a solicitation for a resilient power study, and Maryland has established a task force and produced a report, and is planning a solicitation. Vermont has supported a $12.5 million resilient power, solar+storage microgrid project with additional U.S. Department of Energy (DOE) funding. These programs have largely been funded by system benefit charges, alternative compliance payments from utilities, and supportive federal solicitations and disaster relief funds.

In addition, a few states have begun working with utilities and regulators to modernize electric grids and markets, replace retiring generation plants, improve resilience and reliability, and increase clean and distributed energy resources. An example is New York, with its Reforming the Energy Vision (REV) process. As a small part of this overarching grid modernization plan, ConEdison has allocated $66 million to CHP deployment in its service territory, expanding NYSERDA’s existing CHP program, which has already supported the deployment of more than 140 CHP systems, all capable of islanding in case of a grid outage.

Because of these state programs, 40 municipalities in the Northeast now have resilient power projects underway, which will support more than 90 critical facilities, at a likely capital cost of several hundred million dollars. In other words, larger resiliency goals have now been translated into real, on-the-ground community projects protecting communities and their vulnerable populations.

We are at the start of a revolution—creating a new field of clean energy: resilient power. States and communities are coming around to the notion that we can provide reliable, resilient power to critical facilities and communities by using clean, distributed generation, such as solar and energy storage. This is both climate change mitigation (as it reduces carbon fuel use) and climate adaptation (as it protects people from climate impacts).

The technology has arrived, and it is increasingly affordable. What is needed are supportive policies, innovative financing, and information-sharing efforts about the benefits—which could be demonstrated by multiple resilient power projects in all regions of the country, to get these systems deployed widely.
Clean Energy Group

Clean Energy Group (CEG) is a national, nonprofit organization that promotes effective clean energy policies, develops low-carbon technology innovation strategies, and works on new financial tools to advance clean energy markets. CEG works at the state, national, and international levels with stakeholders from government, the private sector, and nonprofit organizations. CEG promotes clean energy technologies in several different market segments, including resilient power, energy storage, solar, and offshore wind. Above all, CEG also works to create comprehensive policy and finance strategies to scale up clean energy technologies through smart market mechanisms, commercialization pathways, and financial engineering. CEG created and now manages a sister organization, the Clean Energy States Alliance, a national nonprofit coalition of public agencies and organizations working together to advance clean energy through public funding initiatives.